CROATIA: SMALL AREA POVERTY ESTIMATIONS

Project co–financed by the European Union from the European Fund for Regional Development
Objective

Understanding spatial poverty and social exclusion in Croatia
Spatial definitions in Croatia

- Spatial Disaggregation used: 429 (municipalities) + 126 (towns) + Zagreb (17 districts)
- Municipality and city level (LAU-2): 556
- NUTS-3: 21 Counties

Between 2007 and 2012 there were 3 statistical regions:
- Northwest Croatia
- Central and Eastern Croatia
- Adriatic Croatia

As of September 2012 these regions were consolidated into NUTS-2 regions
- Adriatic
- Continental

At time of Census there were 3 statistical regions
At-Risk-of-Poverty

- At-risk-of-poverty (AROP) estimates are obtained from the European Union Statistics on Living Conditions Survey (EU SILC)

- AROP is representative at an aggregated level, in Croatia it is at the statistical region level (in 2012 the AROP rate for Croatia was 20.4%, while the AROP rate at the regional level ranges from 16.7 to 29.1%)

- At levels below the three statistical area level, the SILC is not representative, and thus direct estimates are un-reliable

- Small area estimation methods make it possible to obtain AROP rates at more disaggregated levels such at NUTS-3, and city/municipality (LAU-2) levels

- Methods such as the one from Elbers, Lanjouw and Lanjouw (2003) are applied in order to obtain headcount poverty rates using the Census
Small area estimations of welfare

- Areas where direct estimates lack the required precision are referred to as small areas.

- The SILC is the main source for indicators of living conditions, poverty, and social exclusion in the EU. Samples are not representative at the level of small sub-national units.

- The HBS is used for updating and constructing weights for the CPI, and for the needs of national accounts (computing the grey economy and rent imputation). Sample is only representative at the national level.

- The Census provides full coverage, which permits assessment of small areas, but has limited information on welfare and consequently poverty and social exclusion indicators.

The solution is to combine the strengths of census and survey. This procedure allows the estimation of poverty levels at smaller area levels such as at LAU2 level.
What is needed?

- A set of variables which are common across the Census and the SILC/HBS
  - Variables should have similar definitions
  - These variables also have to be correlated to welfare
  - Additionally, variables have to show similar distributions
- All observations which have any missing information must be removed from calculations
- Additionally municipalities/cities in the SILC/HBS which have less than 3 households are removed.
Disposable Income-Based Poverty Mapping

• Using EU-SILC
  • Original Sample size in 2012: 5,853
  • Representative at Statistical area level

• Focus on net disposable income (HY020)

• Define at risk of poverty threshold as 60 percent of the median adult equivalized disposable income
  • Threshold is at 24,000 Kuna
  • Poverty rate is 20.4%
  • This threshold uses disposable income with negative values as well as zeroes
Using HBS
- Sample size in 2011: 2,335
- Representative at National level

Adult equivalized consumption, which has been calculated by CBS
- Using adult equivalized consumption the at-risk-of-poverty threshold is very close to the income threshold (23,919 vs 24,000 Kuna)
- Adult equivalized consumption is the welfare measure used
- Setting the poverty threshold at 60 percent of the median per adult equivalent consumption gives a threshold of 23,918.62 Kuna
Imputing welfare from SILC/HBS to Census

- Using statistical prediction methods we produce poverty estimates at the municipal and city level for Croatia
- Elbers, Lanjouw and Lanjouw (ELL), and Empirical best (EB) methods
- Estimate a model of adult equivalized log income/consumption using the survey data
  - Simulate welfare for every household in the census by using parameters from the survey estimated model
  - Using simulated welfare we estimate the expected level of poverty and inequality for each municipality in the country
- Comparing first moments of the variables and choosing those which are not considerably different and that are defined similarly across the survey and the census (a valid model which provides a high enough R-squared)
- Observations are lost due to employment inconsistencies and due to municipalities/cities that have less than 3 observations
# Results for the SILC and HBS

<table>
<thead>
<tr>
<th>NUTS-2</th>
<th>AROP EU-SILC EU-SILC Predicted</th>
<th>AROP HBS HBS Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continental</td>
<td>22.0% 20.0%</td>
<td>18.0% 19.4%</td>
</tr>
<tr>
<td>Adriatic</td>
<td>17.0% 17.4%</td>
<td>12.6% 12.6%</td>
</tr>
<tr>
<td>Republic of Croatia</td>
<td>20.4% 19.2%</td>
<td>16.3% 17.1%</td>
</tr>
</tbody>
</table>

Note: Poverty threshold 24,000 HRK per adult equivalent

Note: Poverty threshold 23,918.62 HRK per adult equivalent
SILC: Poverty Rate and Proportion of the Poor (NUTS-2)

Direct estimates
SILC: Poverty Rate (left) and Proportion of the Poor (NUTS3)
SILC: Poverty Rate and Proportion of the Poor (municipalities, cities, and districts of Zagreb)
HBS: Poverty Rate and Proportion of the Poor (NUTS-2)

Small area estimates
HBS: Poverty Rate and Proportion of the Poor (municipalities, cities, and districts of Zagreb)

Small area estimates

Small area estimates. Adult equivalized consumption poverty. Poverty threshold 23,918.62 HRK

Small area estimates. Adult equivalized consumption poverty. Poverty threshold 3,918.62 HRK